**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY**
**REGION 10**
1200 Sixth Avenue
Seattle, Washington 98101

July 23, 1998

**MEMORANDUM**

**SUBJECT:** Response to Comments on the Proposed Remedy for the Idaho Chemical Processing Plan (ICPP) of the Idaho National Engineering and Environmental Laboratory (INEEL)

**FROM:** Randy Smith, Director, Environmental Cleanup Office, EPA Region 10

**TO:** Bruce Means, Chair, National Remedy Review Board (NRRB)

My staff and I appreciate the effort on the part of the NRRB in reviewing the proposed remedy for the ICPP at INEEL. The purpose of this memorandum is to explain how Region 10 intends to address the following comments submitted by the NRRB on the proposed remedy.

**General Comments:**
**1)** Decision documents should include an explanation of the relationship between soil groups, perched groundwater, and the Snake River aquifer.

**Response:** We agree that the definition of contaminated sites by media (soil, perched water, and groundwater) and the fact that the NRRB did not have a Proposed Plan to review, made it difficult to see the relationship between different sites and the impact of contaminants migrating between these sites. To address this concern, a section of the Proposed Plan has been devoted to explaining the relationships between the various sites at the ICPP. For example, contaminated soils in the vadose zone under the Tank Farm have the potential to significantly contribute to the contamination of the Snake River Plain Aquifer. We will also ensure that this discussion is carried into the Record of Decision.

**2)** Restructure cost estimates in the decision documents to: 1) include present worth costs for each alternative, and 2) exclude baseline operating costs for operating facilities.

**Response:** The information provided the NRRB was pre-Proposed Plan. As we stated at the review, the cost estimate provided in the Proposed Plan and ROD will be in terms of present worth in keeping with the NCP. DOE also wants to show costs in current year (1997) non-discounted dollars, to reflect future budget needs. The only baseline operating costs included in the alternative cost estimates is for environmental monitoring and institutional controls (security, maintenance of fences, worker medical monitoring, etc.) which DOE would be required to conduct during the period it continues to operate the ICPP in order to protect workers and the

public from unacceptable risks. For this reason, the "no action" alternative for each operable unit only includes ongoing monitoring and institutional control costs. We recognize that some of the institutional controls specified for individual sites contain controls which would also benefit other sites, and therefore these institutional control costs appear redundant. This was done in the Feasibility Study to ensure that the evaluation of alternatives for each group of sites be independent of the evaluation of alternatives for the other sites. To inform the public of this situation, the Proposed Plan will include a discussion of potential cost saving for the integrated cleanup project if the preferred alternatives are selected. The ROD will provide an integrated project cost estimate and will specifically identify these cost savings.

**3)** A future industrial land use scenario may be a more appropriate for this site instead of a residential land use scenario.

**Response:** An evaluation of what is an appropriate cleanup depth at INEEL is complicated by concern for adequate protective measures for current workers as well as for potential future users of the site beyond the period of government control. The remedial action objective for a 100-year future use residential scenario at INEEL is to achieve a 10E-4 residential risk. This 10E-4 residential risk would approximately equal a 10E-5 future industrial risk with the exception of the excavation depth. A 10-foot excavation depth is considered reasonable for a residential scenario since residential dwellings are assumed to have basements. A 5-foot excavation depth is considered reasonable for an industrial scenario since buildings are assumed to be built on slabs whose footings go below the frost penetration zone, which is 5 feet below the surface at INEEL. DOE estimates it would cost about $50 Million to excavate contaminated soil at the ICPP to a depth of 10 feet, and estimates it would cost about $44 Million to excavate to a depth of 5 feet. This would result in a potential cost savings of $6 Million (12% savings).

Unfortunately, given the time constraints imposed by the NRRB, our presentation on the ICPP did not focus on the risk to current workers. The risk to current workers due to radioactive soil (excluding the Tank Farm soil) exceeds a 10E-3 risk using EPA default parameters. Under the current nuclear industry scenario, new industrial construction would require excavation depths of at least 10 feet. In our discussions with DOE and the State of Idaho, both agencies believe that the 10 feet excavation depth is appropriate given the potential risk to current workers and the extent of radioactivity present.

**Ground Water Actions:**

1) Explain how selection of the natural attenuation remedy for the Snake River Plain aquifer is consistent with OSWER guidance.

**Response:** Rather than a monitored natural attenuation approach, the preferred alternative now identifies an "action level" concentration for I-129. Concentrations of I-129 currently exceeding this action level (6.0 pCi/L) are predicted to result in I-129 concentrations exceeding the MCL at the end of the institutional control period. If concentrations of I-129 are found in sufficient

quantities above this action level during remedial design monitoring, a pump and treat system would be installed to both contain and remove the portion of the I-129 mass which would cause an exceedance of the MCL in the future. Prior to implementing such a remedial action, a treatability study would be conducted to determine the feasibility of achieving the cleanup goal for I-129 through treatment. Based on current field data, which indicates that model predictions are conservative, we do not believe that I-129 concentrations will be found to exceed the selected action level.

**2)** DOE should assess the need for the interim surface water control action for the tank farm soils by evaluating the potential reduction in contaminant mobility that would result from this action.

**Response:** An analysis was conducted to determine the relative impacts on the migration of contaminants from the Tank Farm soils by implementing surface water controls through an interim remedial action. The Tank Farm area is approximately 145,000 $ft^2$. Currently the precipitation from an area of approximately 256,000 $ft^2$ (1.8 times the area of the Tank Farm) is allowed to drain into the Tank Farm area. As a result, the natural precipitation of 8.9 in/yr produces an average of 15.9 in/yr of potential infiltration in the Tank Farm area. Implementation of the proposed interim action would reduce this infiltration in the Tank Farm area by approximately 80%. The impact of this reduction in the infiltration rate for three of the major contaminates (Cs-137, Sr-90 and Pu) was analyzed using a simple model to simulate the movement of these contaminants through the Tank Farm soils. The results of this modeling indicate that the proposed reduction in infiltration would decrease the rate of contaminant migration by a factor of 5, significantly decreasing the mass of contaminants eventually reaching the perched water and the aquifer. If these surface water controls are kept in place until the final Tank Farm soil remedy is implemented, the concentrations of Sr-90, Cs-137, and Pu eventually reaching the perched water would decrease by factors of 8.7, $1.5x10^8$, and 4.7, respectively. Therefore, by controlling the source of contamination through reducing water infiltration, the benefit would be to significantly reduce the migration of radioactivity into the aquifer and eliminate the need for costly future groundwater remedial action. Based on this rationale, we support surface water control as a component of the preferred interim action for the Tank Farm soils.

**Soil Actions:**

**1)** The Board recommends that DOE include in the decision documents for this site its rationale for managing the site's principal threat source materials through containment.

**Response:** The majority of ICPP soil regarded as principle threat soil is the Tank Farm soil, because it poses a high risk due direct exposure and groundwater contamination. The Tank Farm soil has been designated as a separate operable unit for a separate RI/FS and ROD. Remediation of the Tank Farm soil will likely include a treatment component to reduce mobility and/or toxicity of contaminants. Soil outside of the tank farm contains some principle treat soil because of a high risk associated with direct exposure. Soil sorting and soil washing, two soil treatment

technologies to reduce soil volume, were evaluated for this soil in the Feasibility Study. Soil sorting was retained as a feasible technology for Alternative 4B, which includes off-site disposal of this contaminated soil, but was not retained as a component of Alternative 4A (on-site disposal) because soil sorting was not found to be cost effective for on-site disposal.

After conducting an evaluation, alternative 4A, which calls for containment of contaminated soil in a repository to be constructed at ICPP, was selected as the preferred alternative. This repository would have an engineered cover and liner, which if properly maintained, would provide adequate human health and environmental protection through containment until the radionuclides in the contained soil naturally decay to acceptable levels. This on-site repository was selected as the preferred alternative because it provides adequate protection and was found to be more cost effective than other alternatives being considered.

**2)** DOE should provide a detailed discussion about the proposed site-wide waste management facility, including the nature and volumes of soil to be place in this facility.

**Response:** A summary discussion of the costs and benefits of an INEEL-wide soil repository will be provided in the Proposed Plan. A detailed discussion of the costs and benefits of this repository, the types and volumes of soils to be place in the repository, and the waste acceptance criteria for this repository would be provided in the ROD.

**3)** DOE should defer selecting between alternative 2 and 3 for the Soils Under Buildings site until a post-demolition disposal assessment has been conducted. DOE should keep the proposed on-site waste repository available to receive these soils if needed.

**Response:** We acknowledge the uncertainty in selecting a final remedy for the soils Under Buildings site where the the future D&D action has not yet been selected. However, we believe that a preferred alternative which includes interim institutional controls until the D&D action occurs, and a final remedy based on the most probable D&D action, can be selected at this time. In regard to the future D&D action for this site, the cost of complete removal of all four buildings which cover areas of contamination at this site is significantly more expensive than the cost of demolishing these building in place. Given the current budget constraints for DOE, and the likelihood that the budget for future D&D actions will also be constrained, the most likely future D&D action will be demolition of these structures in place. Since contaminated soil would not be accessible under this scenario, the most cost-effective remedial action would be to place a containment cover over the contaminated soil and building debris. Alternative 2, the preferred alternative, consists of institutional controls until D&D action occurs and then containment of the contaminated soil with an engineered barrier. This barrier would be designed to prevent future exposure, allowing for natural radioactive decay to reduce radionuclide concentration to levels that are not a risk to human health. The barrier would also be designed to minimize moisture infiltration and leaching of contaminants from the underlying soils. In the unlikely event that the D&D Program removes the buildings and their foundations, contaminated soils would be removed and disposed as described in Alternative 3, which is the contingent alternative.

Again, we appreciated the effort by the NRRB in reviewing the proposed remedy for the ICPP. This review identified components of the remedy which needed to be revised or refined prior to the Proposed Plan to ensure that the remedy was appropriate and cost-effective.